

120681

FAA-00-7909-15

January 16, 2001

DEPT. OF TRANSPORTATION
DOCTETS

01 JAN 17 AM 9:48

U. S. Department of Transportation Dockets
Docket No. FAA-2000-7909
400 Seventh Street SW
Room Plaza 401
Washington DC 20590



Subject: Comments to Docket No. FAA-2000-7909; Notice No. 00-09 titled *Improved Flammability Standards for Thermal/Acoustical Insulation Materials Used in Transport Category Airplanes*

As a long serving member of the International Aircraft Materials Fire Test Working Group (IAMFTWG) and participant in radiant panel testing and burn-through testing (full scale tests and as the proposed test), Inspec Foams submits comments to the above docket. When possible a reference page number is listed. Listed page numbers are for Federal Register / Vol. 65, No. 183 / Wednesday, September 20, 2000 / Proposed Rules.

Radiant Panel Test [Proposed Part VI to Appendix F to Part 25]

- 1: Unit conversion [page 57010]:
Correct conversion of 1.5 Btu/ft²-second is 1.7 Watts/cm².
- 2: Radiant heat type [page 57002]:
Per FAA technical presentations during IAMFTWG, it has been stated the electrical radiant panel will be the preferred test method as more consistent results are provided. The electric radiant panel should be implemented.
- 3: Test specimen construction [page 57010]:
 - a) Specimen construction type can affect performance in this test method. Tests on the proposed radiant panel method and existing FAR 25.853 vertical burn test show variable results pending the tightness, or looseness, of cover film wrapping about batting. Test procedures should fully specify specimen wrapping/construction, installation and containment within the sample holding system.
 - b) It is our understanding the FAA Technical Center is evaluating a less long sample size (12 x 23 inch). Reduction in specimen length is desirable and should not affect test results as the area of interest (zone where pass/fail is determined) extends 5 inches at one end only.
- 4: Refractory support material [page 57005]:
Disagree with the sentence "A sheet of refractory material *may* be placed and supported by the lip in the open bottom (base) of the sliding platform ..." in the proposed rule text. A non-combustible material should always be placed under the sample to ensure it does not fall from the holder. This should be a standard part of the test procedure to ensure consistent results between different laboratories.
- 5: Pilot burner flame – location and sweep [page 57009]:
Inspec Foams test experience has shown pilot burner flame position can differ from that specified in Figure 8 even with good laboratory procedures. A pilot burner positioned closer to the specimen centerline (the zero point) than specified in Figure 8 will cause excessive flame sweep across specimen surface. Tests have shown additional flame sweep across specimen surface ignites materials accumulated at the retaining frame during flame removal.
It is imperative the procedure specify the full flame size (blue inner cone and full yellow flame) as well as maximum pilot flame sweep across a non-combustible board. Current rigid insulation materials form a char layer when exposed to the conditions of this test, radiant heat and pilot flame source. This char layer reflects the flame sweep across the sample. Flame location and sweep across specimen affect test consistency.
- 6: Retaining (Securing) frame [page 57006, 57007]:
Will the new style retaining frame developed by the FAA Technical Center (by Pat Cahill and team) be used? Or will those specified in Figures 5 and 6 be used? A Retaining/Securing frame design need be selected and 'Round Robin' type tests completed for both fibrous (i.e. non-rigid) and rigid (i.e. foam) insulation systems.
Any metallic frame/retaining device (if used) to constrain the specimen and create a level specimen surface at the zero point location must function equally for fibrous (non-rigid) AND rigid (i.e. foams) insulation systems. Rigid insulation types need be considered in IAMFTWG and FAA Technical Center test technique development and 'Round Robin' type verification tests.

7: Round Robin' type tests:

Verification testing at multiple laboratories needs to be completed to evaluate test procedure repeatability.

8: Application to damping materials [page 57001]:

Wording for proposed section 25.856 states "Thermal/acoustic insulation materials must meet ..." is unclear. It should state the rule applies to all thermal and acoustic insulation on fuselage or air-conditioning ducts including skin damping materials. Skin damping materials are the part of thermal acoustic insulation systems adhesively bonded to fuselage. They may be used without the flame protection of a fuselage blanket.

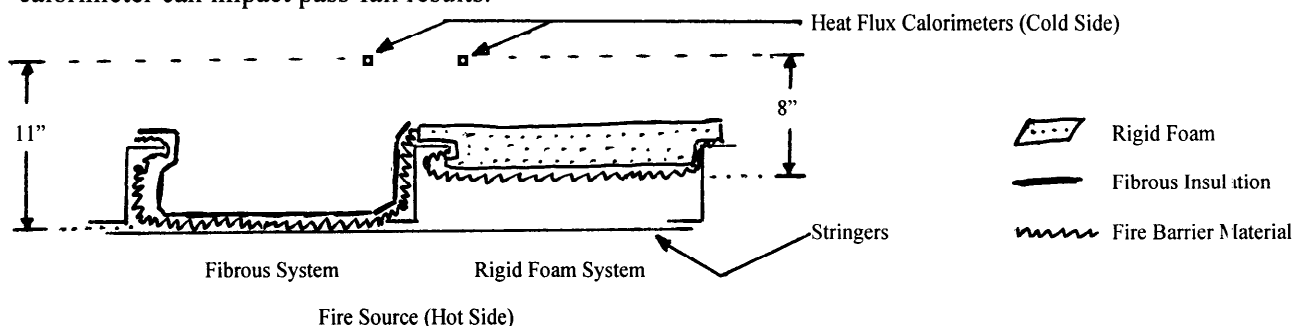
Burn-Through Test [Proposed Part VII to Appendix F to Part 25]

1: Installation of Rigid materials [page 57019]:

Proposed test method states rigid and other non-conforming types of insulation materials (ie rigid foams) be burn-through tested via installation on the test rig "in a manner as to replicate the actual in-service installation". It is possible this can result in situations where a rigid foam system is tested differently than a flexible, fibrous batt system.

The proposed test procedure allows fibrous ('conforming') systems to have a 32 inch wide fire barrier span a 20 inch space between steel frames. Insulation and fire barrier are overlapped and fastened to the steel frame with steel retaining clips. This use of an extra wide blanket and steel fasteners affords a 'conforming' system extra protection, for the test only, that a rigid ('non-conforming') system may not have. This imparts a difference in performance. To date, non-conforming systems (i.e. rigid foams) have not been included in FAA lead "Round Robin" tests as the program is focused on correlating burner and equipment system performance across many laboratories.

A specific example where a rigid system can be tested differently is a thin, 2 inch thick rigid foam blanket that includes over frame insulation in the design. This is a common design for regional jets. The combined blanket includes between frame rigid insulation (20 inches wide), fire barrier and overframe insulation. When installed on the test rig with 5 inch deep frames, the combined blanket containing rigid foam is positioned on and attached to the frames to replicate in-service installation. Assuming the fire barrier layer is towards the fire, the fire barrier layer rests approximately 3 inches from the hat shaped stringers, or 8 inches from the calorimeters. For a 2 inch thick fibrous system, fibrous batting and fire barrier are installed as 32 inch wide batts pressed against the hat shaped stringers and wrapped up the steel frames. Assuming the fire barrier is towards the fire, the fibrous system has its fire barrier 11 inches from the calorimeters. This difference in distance between fire barrier and calorimeter can impact pass-fail results.



Also, when a rigid foam system is tested via installation on the test rig "in a manner as to replicate the actual in-service installation", does this imply that this passing system (insulation, fire barrier, cover films, and attachment articles) is certified as tested? Therefore it is not subjected to additional advisory material regarding its installation (fastener types), material overlap, etc. that is forthcoming as the FAA has mentioned during the IAMF TWG meetings?

I am available to explain the above, please telephone 972 461 8029.

Best regards,

Daniel J. Trahan
Marketing Director
Inspec Foams, Inc.